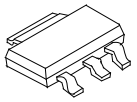
# LR2965A

**CMOS IC**

## 1.5A, LOW DROPOUT REGULATOR



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SOT-223

### ■ DESCRIPTION

The **UTC LR2965A** is CMOS-based positive voltage and a very low dropout regulator IC that minimum input voltage is 2.5V and is capable of delivering the continuous output load current up to 1.5A.

It has features of low dropout (maximum 300mV at 1A), a very low quiescent current (typically 300uA at 0.1A).

The output voltage has ±2% accuracy through all temperature ranges include the line as well as load variations. It is allowed to use a small 4.7μF MLCC input and output capacitor to deliver the current with the stable operation.

Built-in Soft-Start function reduces the inrush current and the other features are include over current protection (OCP), short-circuit protection (SCP), and thermal shut down protection (TSD).

### ■ FEATURES

* Input Voltage Range: 2.5V~6.0V
* Supply Current : (Typ.) 300uA
* Current limit : (Min.) 1.6A
* LR2965A: Typ 0.4V Dropout @ $I_{OUT}$=1.5A
* Compatible with MLCC Capacitors
* Built-in Soft-Start Limits Inrush Current
* Built-in Thermal Shutdown Protection
* Built-in Over Current & Short Circuit Protection

### ■ ORDERING INFORMATION

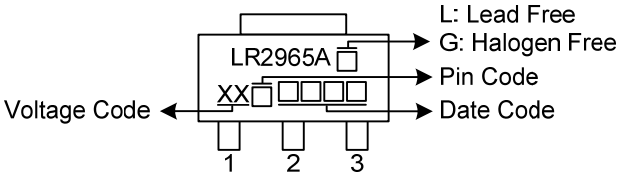
| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| LR2965AL-xx-AA3-D-R | LR2965AG-xx-AA3-D-R | SOT-223 | I | G | O | Tape Reel |

Notes: 1. xx: Output Voltage, refer to Marking Information.
2. Pin Assignment: I: $V_{IN}$ G: GND O: $V_{OUT}$

LR2965AG-xx-AA3-D-R
(1)Packing Type
(2)Pin Code
(3)Package Type
(4)Output Voltage Code
(5)Green Package

(1) R: Tape Reel
(2) refer to Pin Assignment
(3) AA3: SOT-223
(4) x: Refer to Marking Information
(5) G: Halogen Free and Lead Free, L: Lead Free

## ■ MARKING INFORMATION

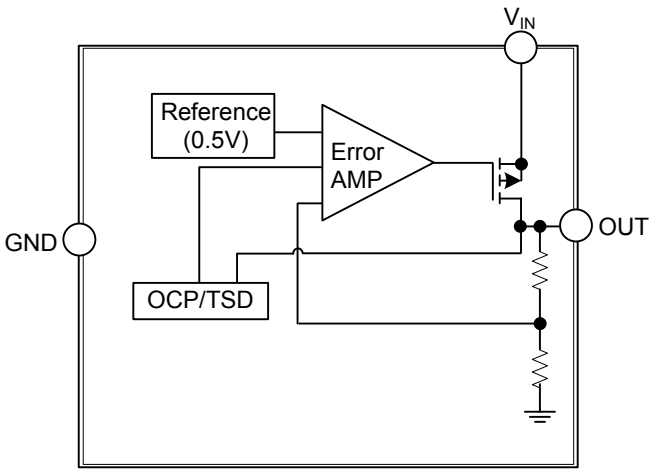
| PACKAGE | VOLTAGE CODE | MARKING |
|---|---|---|
| SOT-223 | 12: 1.2V<br>18: 1.8V<br>25: 2.5V<br>33: 3.3V |  |



## ■ PIN DESCRIPTION

| PIN NO. | PIN NAME | DESCRIPTION |
|---|---|---|
| 1 | $V_{IN}$ | Input Supply Voltage Pin. |
| 2 | GND | Ground Pin |
| 3 | OUT | Voltage Regulator Output Pin |

## ■ BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATING ($T_A$=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Input Voltage | $V_{IN}$ | -0.3 ~ 7 | V |
| Output Voltage | OUT | -0.3 ~ $V_{IN}$+0.3 | V |
| Junction Temperature | $T_J$ | +150 | °C |
| Storage Temperature | $T_{STG}$ | -65 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ RECOMMENDED OPERATING CONDITIONS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Input Voltage Range | $V_{IN}$ | 2.5 ~ 6.0 | V |
| Ambient Temperature Range | $T_A$ | -40 ~ +85 | °C |

## ■ THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Junction to Ambient | $\theta_{JA}$ | 165 | °C/W |
| Junction to Case | $\theta_{JC}$ | 15 | °C/W |

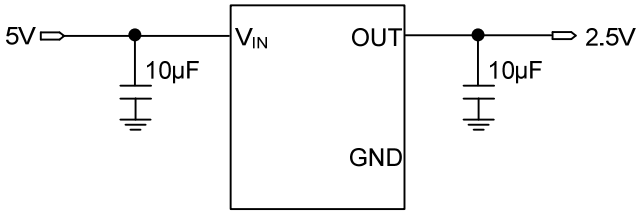
## ■ ELECTRICAL CHARACTERISTICS

All parameters are guaranteed over the operational supply voltage and temperature range. Operating conditions unless otherwise noted are: $V_{IN}$=5V, OUT=2.5V and $T_A$=25°C. Typical values are for information only.

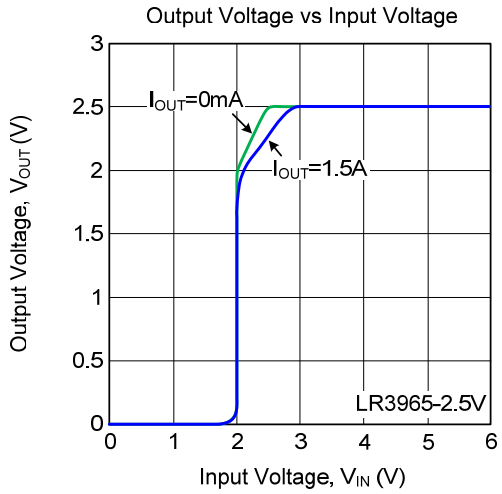
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| **Supply Voltage** | | | | | | |
| Quiescent Current | $I_Q$ | $I_{OUT}$=100mA | | 300 | 450 | uA |
| **Output (OUT)** | | | | | | |
| Output Accuracy | $V_{OUT}$ | | -2 | | 2 | % |
| Load Regulation | $R_{LO}$ | $I_{OUT}$=1mA to 1.5A | | 0.1 | 2 | %/A |
| Line Regulation | $R_{LN}$ | $V_{IN}$=2.2~6V, $V_{OUT}$=1.225V, $I_{OUT}$=1mA | -0.2 | | 0.2 | %/V |
| Dropout Voltage | $V_D$ | $I_{OUT}$=1.5A,$V_{FB}$=480mV | | 400 | | mV |
| | | $I_{OUT}$=1A,$V_{FB}$=480mV | | 140 | 280 | |
| | | $I_{OUT}$=0.5A,$V_{FB}$=480mV | | | 200 | |
| Current Limit | $I_C$ | | 1.6 | | | A |
| Load transient (Note 1) | $L_{OT}$ | $I_{OUT}$=20mA to 1.5A, | | 3 | | % |
| Line Transient (Note 1) | $R_{NT}$ | $\Delta V_{IN}$=0.5V | | 3 | | % |
| Under Voltage Lockout | UVLO | | | 2 | | V |
| Under Voltage Hysteresis | | | | 0.4 | | V |
| **Thermal Shutdown (TSD) (Note 1)** | | | | | | |
| TSD Threshold | $T_{SDON}$ | TSD On | | 165 | | °C |
| | $T_{SDOFF}$ | TSD Off | | 145 | | °C |

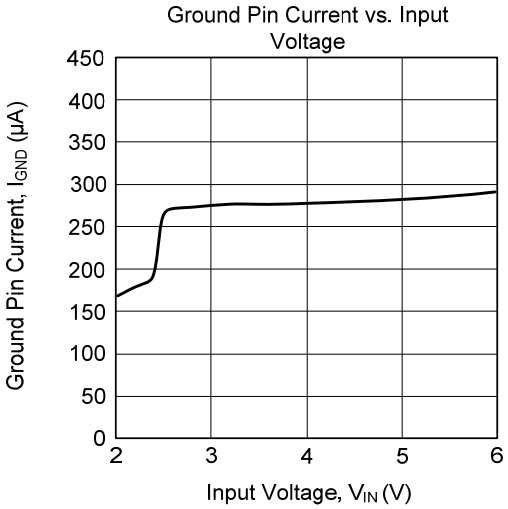
Note: Guaranteed by design but not production tested.

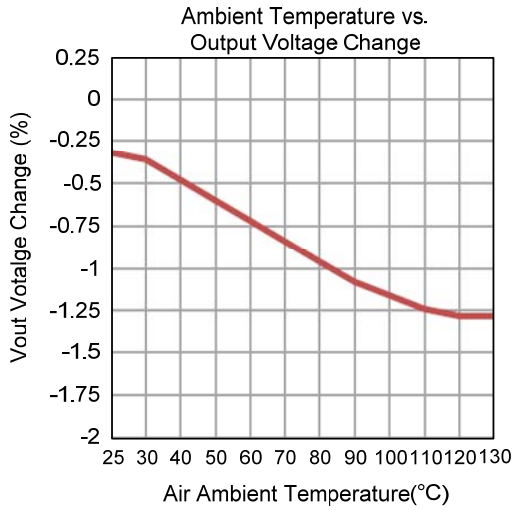
## ■ TYPICAL APPLICATION CIRCUIT

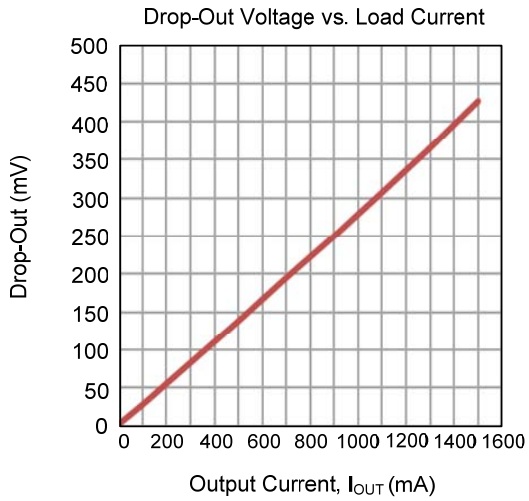


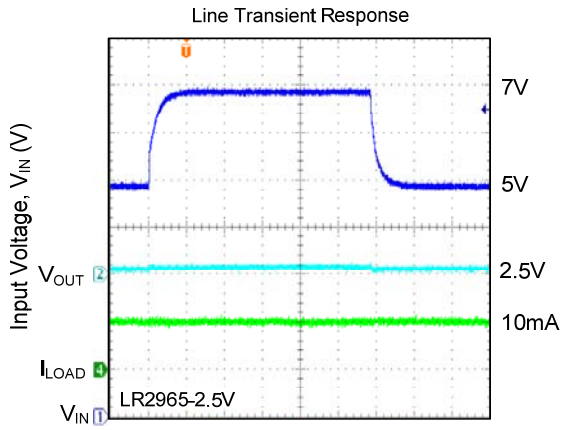
## ■ TYPICAL CHARACTERISTICS

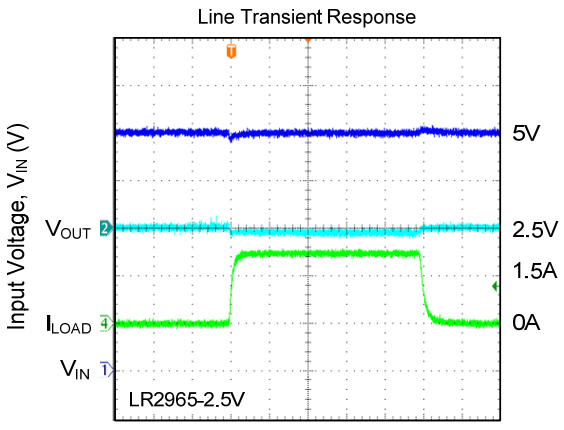


■ TYPICAL CHARACTERISTICS (Cont.)